CLAIMS

What is claimed is:

1. A process for designing a model based system architecture, comprising:

providing a business process design, the business process design describing a plurality of business processes and defining a set of business requirements for each business process;

constructing a multi-layer mathematical model of a system architecture supporting the business process design, the layers of the multi-layer model comprising a business layer, an application layer, and a technology layer;

modeling performance metrics for each layer of the multi-layer model of the system architecture;

comparing the modeled performance metrics with the set of business requirements for each business process, said comparing producing respective indications of unacceptable performance metrics of one or more business processes that do not satisfy the set of business requirements defined for them based on the produced indications; and

determining modifications to the system architecture.

2. The process of claim 1, further comprising:

proposing the modifications to the system architecture;

modeling updated performance metrics for each layer of the model of the system architecture with the proposed modifications;

comparing the updated performance metrics with the set of business requirements for each business process; and

outputting a description of the system architecture if the updated performance metrics satisfy the set of business requirements.

3. The process of claim 1, wherein determining modifications to the system architecture, further comprises:

identifying component models in the application and technology layers that support the one or more business processes having unacceptable performance metrics;

evaluating the performance metrics of the supporting component models in order to identify one or more supporting component models having unacceptable performance metrics; and

searching a data store for modifications to improve the unacceptable performance metrics of the one or more supporting component models.

4. The process of claim 3, wherein the modifications to improve the unacceptable performance metrics of the one or more supporting component models include replacement of the one or more supporting component models with alternate component models from the data store.

5. The process of claim 3, further comprising:

proposing that the business process design be modified, if none of the supporting component models in the application or technology layers have unacceptable performance metrics.

6. The process of claim 1, wherein constructing the multi-layer mathematical model of the system architecture, comprises:

mapping each business process to an application component model in the applications layer, each application component model linked to one or more component models in the application and technology layers, which support the application component model.

7. The process of claim 6, wherein the application layer further comprises a technology bus, the technology bus modeling an abstract interface for data access or technology services between the components modeled in the application and technology layers.

8. The process of claim 6, wherein the application layer further comprises a application bus, the application bus modeling a communication, distribution, and management interface between application component models in the application layer.

9. The process of claim 6, wherein application component models in the application layer are subdivided into a business applications layer and an application engines layer, the business applications layer comprising models of application components providing real-time or right-time processing, the application engines layer comprising models of application components that provide deferrable processing and support one or more application components in the business applications layer.

10. The process of claim 6, wherein any combination of component models supporting a business process may be substituted to improve unacceptable performance metrics of the business process.

11. A system for designing a model based system architecture, comprising:

a business process design, the business process design describing a plurality of business processes and defining a set of business requirements for each business process;

an architecture construction module responsive to the business process design, the architecture construction module constructing a multi-layer mathematical model of a system architecture supporting the

business process design, the layers of the multi-layer model comprising a business layer, an application layer, and a technology layer;

a performance modeling module coupled to the architecture construction module, the performance modeling module modeling performance metrics for each layer of the multi-layer model of the system architecture;

a comparison module coupled to receive the modeled performance metrics and the business process design, the comparison module comparing the modeled performance metrics with the set of business requirements for each business process and determining unacceptable performance metrics of one or more business processes that do not satisfy the set of business requirements defined for them;

a rule-based modification engine, the rule-based engine determining modifications to the system architecture in order to improve the unacceptable performance metrics determined by the comparison module; and

an output module coupled between the rule-based engine and the architecture construction module, the output module proposing the determined modifications to the model of the system architecture.

12. The system of claim 11, wherein:

the performance modeling module further models updated performance metrics for each layer of the model of the system architecture with the proposed modifications;

the comparison module further compares the updated performance metrics with the set of business requirements for each business process; and

the output module further outputs a description of the system architecture if the updated performance metrics satisfy the set of business requirements.

13. The system of claim 11, wherein:

the architecture construction module further identifies supporting component models in the application and technology layers that support the one or more business processes having unacceptable performance metrics;

the comparison module further evaluates the performance metrics of the supporting component models in order to identify one or more supporting component models having unacceptable performance metrics; and

the rule-based engine further searches a data store for modifications to improve the unacceptable performance metrics of the one or more supporting component models.

14. The system of claim 13, wherein the modifications to improve the unacceptable performance metrics of the one or more supporting component models include replacement of the one or more supporting component models with alternate component models.

15. The system of claim 13, wherein:

the output module further proposes that the business process design be modified, if none of the supporting component models in the application or technology layers have unacceptable performance metrics.

16. The system of claim 11, wherein the architecture construction module maps each business process to an application component model in the applications layer, each application component model being linked to one or more component models in the application and technology layers, which support the application component model.

17. The system of claim 16, wherein the application layer further comprises a technology bus, the technology bus modeling an abstract interface for data access or technology services between the components modeled in the application and technology layers.

18. The system of claim 16, wherein the application layer further comprises an application bus, the application bus modeling a communication, distribution, and management interface between application component models in the application layer.

19. The system of claim 16, wherein application component models in the application layer are subdivided into a business applications layer and an application engines layer, the business applications layer comprising models of application components providing real-time or right-time processing, the application engines layer comprising models of application components that provide deferrable processing and support one or more application components in the business applications layer.

20. The system of claim 16, wherein any combination of component models supporting a business process may be substituted to improve unacceptable performance metrics of the business process.

21. A system for designing a system architecture, comprising:

means for receiving a business process design, the business process design describing a plurality of business processes and defining a set of business requirements for each business process;

means for constructing a multi-layer mathematical model of a system architecture supporting the business process design, the layers of the multi-layer model comprising a business layer, an application layer, and a technology layer;

means for modeling performance metrics for each layer of the multi-layer model of the system architecture;

means for comparing the modeled performance metrics with the set of business requirements for each business process;

means for determining modifications to the system architecture in order to improve unacceptable performance metrics of one or more business processes that do not satisfy the set of business requirements defined for them; and

means for proposing the modifications to the model of the system architecture.

22. A system architecture that is generated by the process of claim 1.

23. An article of manufacture, comprising:

a computer-usable medium;

a set of computer operating instructions embodied on the medium, including instructions for designing a model based system architecture, comprising instructions for:

providing a business process design, the business process design describing a plurality of business processes and defining a set of business requirements for each business process;

constructing a multi-layer mathematical model of a system architecture supporting the business process design, the layers of the multi-layer model comprising a business layer, an application layer, and a technology layer;

modeling performance metrics for each layer of the multi-layer model of the system architecture;

comparing the modeled performance metrics with the set of business requirements for each business process, said comparing producing respective indications of unacceptable performance metrics of one or more business processes that do not satisfy the set of business requirements defined for them based on the produced indications; and

determining modifications to the system architecture.

24. A computer data signal embodied in a carrier wave comprising a code segment for designing a model based system architecture, the code segment comprising instructions for:

providing a business process design, the business process design describing a plurality of business processes and defining a set of business requirements for each business process;

constructing a multi-layer mathematical model of a system architecture supporting the business process design, the layers of the multi-layer model comprising a business layer, an application layer, and a technology layer;

modeling performance metrics for each layer of the multi-layer model of the system architecture;

comparing the modeled performance metrics with the set of business requirements for each business process, said comparing producing respective indications of unacceptable performance metrics of

one or more business processes that do not satisfy the set of business requirements defined for them based on the produced indications; and

determining modifications to the system architecture.

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